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L23

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|------------|--|------|------------|
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| <u>L22</u> | L20 and 16                                       | 4    | <u>L22</u> |
| <u>L21</u> | L20 and 15                                       | 9    | <u>L21</u> |
| <u>L20</u> | 14 and (indices or index\$5 or number\$4)        | 30   | <u>L20</u> |
| <u>L19</u> | 13 and (indices or index\$5 or number\$4) and 17 | 5    | <u>L19</u> |
| <u>L18</u> | 13 and (indices or index\$5 or number\$4) and 16 | 17   | <u>L18</u> |
| <u>L17</u> | 13 and (indices or index\$5 or number\$4) and 15 | 57   | <u>L17</u> |
| <u>L16</u> | 13 and (indices or index\$5 or number\$4)        | 1191 | <u>L16</u> |
| <u>L15</u> | 13 and index\$5                                  | 806  | <u>L15</u> |
| <u>L14</u> | 14 and 17  | 1    | <u>L14</u> |
| <u>L13</u> | 14 and 16  | 4    | <u>L13</u> |
| <u>L12</u> | 14 and 15  | 9    | <u>L12</u> |
| <u>L11</u> | L8 and 17  | 5    | <u>L11</u> |

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| <u>L10</u>  | L8 and l6   | 17    | <u>L10</u> |
| <u>L9</u>   | L8 and l5   | 52    | <u>L9</u>  |
| <u>L8</u>   | l3 and load and store   | 657   | <u>L8</u>  |
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| <u>L7</u>   | (712/217)[CCLS]   | 520   | <u>L7</u>  |
| <u>L6</u>   | (712/216-219)[CCLS]   | 1427  | <u>L6</u>  |
| <u>L5</u>   | (712/2-300)![CCLS]  | 11905 | <u>L5</u>  |
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| <u>L4</u>   | L3 and scoreboard\$3  | 30    | <u>L4</u>  |
| <u>L3</u>   | L2 and (exclusive\$4 or unique\$6) near6 (id\$1 or identif\$7)          | 1195  | <u>L3</u>  |
| <u>L2</u>   | (table or scoreboard\$3) near25 entr\$4 near25 (valid\$7 or invalid\$7) | 3364  | <u>L2</u>  |
| <u>L1</u>   | scoreboard\$3 near15 entr\$4 near25 (valid\$7 or invalid\$7)            | 32    | <u>L1</u>  |

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## Issue logic for a 600-MHz out-of-order execution microprocessor

[Farrell J.A.](#) [Fischer T.C.](#)

Digital Equipment Corp., Hudson, MA, USA;

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## Abstract

The logic and circuits are presented for a 20-entry instruction queue which **scoreboards** 80 registers and issues four in a 600-MHz microprocessor. The request logic and arbiter circuits that control integer execution are described in addition; compaction scheme that maintains temporal order in the queue. The issue logic data path is implemented in 141000 transistors in a 0.35- $\mu\text{m}$  CMOS process

## Index Terms

## Indexing

## Controlled Indexing

[CMOS digital integrated circuits](#) [microprocessor chips](#)

## Non-controlled Indexing

[0.35 micron](#) [600 MHz](#) [CMOS process](#) [arbiter circuits](#) [compaction scheme](#) [instruction queue](#) [integer execution](#) [issue logic](#) [logic data path](#) [out-of-order execution microprocessor](#) [request logic](#) [temporal order](#)

## Author Keywords

Not Available

## References

1. B. Gieseke, et al., "A 600 MHz superscalar RISC microprocessor with out-of-order execution," *ISSCC Dig. Tech. P.* Feb. 1997.  
[Abstract](#) | [Full Text: PDE](#) (728KB)
2. N. B. Gaddis, J. R. Butler, A. Kumar, and W. J. Queen, "A 56-entry instruction reorder buffer," *ISSCC Dig. Tech. P.* Feb. 1996.  
[Abstract](#) | [Full Text: PDE](#) (1068KB)
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## Citing Documents

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*Computers, IEEE Transactions on*  
On page(s): 268-285, Volume: 50, Issue: 3, Mar 2001  
[Abstract](#) | [Full Text: PDE](#) (1616)